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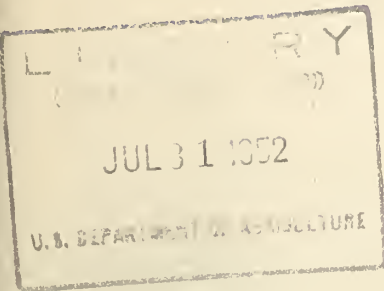


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AGRICULTURAL RESEARCH ADMINISTRATION  
BUREAU OF AGRICULTURAL AND INDUSTRIAL CHEMISTRY

Southern Regional Research Laboratory  
2100 Robert E. Lee Boulevard  
New Orleans 19, Louisiana



× LIST OF PUBLICATIONS AND PATENTS,

Southern Region,

July - December 1951 ×

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SOUTHERN REGIONAL RESEARCH LABORATORY  
2100 Robert E. Lee Boulevard  
New Orleans, La.

ARTICLES AND ADDRESSES

No.

Apparatus and Machinery, Analytical Methods, and Techniques

- 1 BROWN, Lawrence E., and Hoffpauir, Carroll L.

DETECTION OF NITROGEN IN ORGANIC COMPOUNDS. *Analyt. Chem.* 23(7):  
1035-1036. 1951.

By adapting the fluorescence method of detecting ammonia to the calcium oxide test, a rapid and simple test for nitrogen on a microgram scale has been developed.

- 2 CONRAD, Carl M., Tripp, Verne W., and Mares, Trinidad

INTRINSIC VISCOSITIES OF CELLULOSE AS AFFECTED BY RATE OF SHEAR. *Jour. Phys. Colloid Chem.* 55(9): 1474-1491. 1951.

Martin's equation for determining intrinsic viscosity has been applied to 7 celluloses, representing an extreme range of degrees of polymerization. Results of the determinations, made in both cuprammonium and cupri-ethylenediamine solvents, were read off from curves at the velocity gradients 300, 500, and 200 sec.<sup>-1</sup> The intrinsic viscosities were also computed from viscometer readings taken without regard to velocity gradient.

- 3 HOFFPAUIR, Carroll L.

REPORT ON STARCH IN PLANTS. *Assoc. Off. Agr. Chem. Jour.* 34(3): 698-700. 1951.

The method for the determination of small amounts of starch in plant material (*Assoc. Off. Agr. Chem. Jour.* 33, 810. 1950) has been further studied on samples of alfalfa leaf meal, buckwheat leaves, and peanut meal. The values obtained show poor precision. It was apparent, however, that the agreement between individual determinations and the agreement among analysts were considerably improved when the values obtained in preliminary determinations were discarded. The results show some promise for the method, particularly for plant materials containing very small amounts of starch, and its further study is recommended.

No.

- 4 REEVES, Wilson A., Drake, George L., Jr., and Hoffpauir, Carroll L.

ETHYLENIMINE BY FLASH DISTILLATION. Amer. Chem. Soc. Jour. 73(7): 3522. 1951.

A process for the preparation of ethylenimine based upon the flash distillation of a solution consisting of 2-aminoethyl hydrogen sulfate and sodium hydroxide is described. The yield obtained was 85%.

- 5 RUSCA, Ralph A.

FIGURE EVENNESS BY MACHINE OR PLANIMETER? Textile Indus. 115(7): 79-81, 178. 1951.

Tests of the Uster Yarn Evenness Tester under slightly different atmospheric conditions at the Southern Regional Research Laboratory showed that the minor fluctuations in conditions did not significantly affect the measurement of long-term variations in product uniformity; but that they did affect the measurement of short-term variations. Reading percentages directly from the chart produced results comparable to those obtained by the use of a planimeter, and in one-eighth to one-tenth the time.

- 6 SEGAL, Leon.

FUCHSIN-SULFITE REAGENT IN COLORIMETRIC DETERMINATION OF FORMALDEHYDE. Analyt. Chem. 23(10): 1499. 1951.

It was shown that Schiff's reagent used in the colorimetric formaldehyde determination, as developed by Hoffpauir, Buckaloo, and Guthrie (Ind. Eng. Chem., Anal. Ed., 15, 605 (1943)), may be decolorized with beneficial and no adverse effects by use of certain decolorizing carbons.

- 7 STARK, S. M., Jr., and Hoffpauir, Carroll L.

DETERMINATION OF MOISTURE AND OIL IN SESAME SEED. Amer. Oil Chem. Soc. Jour. 28(12): 516-517. 1951.

Sesame seed may be prepared for analysis by use of the Henry nut slicer equipped with a sharp blade. For the determination of combined moisture and volatile matter in both the whole and ground seed, a 5-g. sample should be dried for 2 hours at 130° C. in a forced-draft oven. The A. O. C. S. official method (Aa 4-38) for cottonseed is satisfactory for the determination of oil in sesame seed, provided a 2-g. sample is reground with 0.25-g. of 60- to 80-mesh sand after an initial 2-hour extraction and then re-extracted for 3 hours.



No.

- 8 TALLANT, John D., and Werner, Ruby K.

APPARATUS FOR EVALUATING WARMTH OF TEXTILE FABRICS. Textile Res. Jour. 21(8): 591-596. 1951.

A semi-automatic apparatus requiring minimum operator attention has been assembled for measuring the thermal transmission of fabrics while subject to moving air at constant temperature. The difference in the amount of energy required to maintain constant temperature in a body when bare and when covered with the test specimen is measured. Conditions have been set up with an air velocity of 12 to 13 m.p.h. so that performance under fairly severe conditions of use can be approximated. The apparatus has been found to differentiate among fabrics ranging from thin, plain-weave, nylon cloth to heavy woolen blankets, and in a manner that apparently takes into account the various fabric properties.

Cotton and Cotton Products

- 9 CATLETT, Mamie S., Giuffria, Ruth, Moore, Anna T., and Rollins, Mary L.

MICROSCOPICAL OBSERVATIONS ON THE CONTENTS OF THE COTTON FIBER LUMEN. Textile Res. Jour. 21(12): 880-886. 1951.

A method is described for isolating the lumen contents of the cotton fiber by digestion of the cellulose in chilled 72% sulfuric acid. Microscopical observations on the isolated "lumens" as well as the lumen in the whole fiber are reported. The isolated lumens appeared tubular in shape, and electron micrographs of thin sheets of the membrane material showed an unoriented, granular structure. The lumen residue isolated by sulfuric acid was found to be completely hydrolyzed in dilute mineral acid. Amino acid determination by paper chromatography disclosed no free amino acids in the lumen material; but in an acid-hydrolyzed sample, glutamic and aspartic acids, valine, alanine, and probably serine and arginine were found, in addition to several unidentified amino acids.

- 10 CONRAD, Carl M., Tripp, Verne W., and Mares, Trinidad.

THERMAL DEGRADATION IN TIRE CORDS. PART I. EFFECTS ON STRENGTH, ELONGATION, AND DEGREE OF POLYMERIZATION. Textile Res. Jour. 21(10): 726-739. 1951.

Thermal degradation in cotton and rayon tire cords before and during processing into tires has been studied. Also, tests were made on the cords from representative cotton and rayon tires which had been operated to failure on a National Bureau of Standards test wheel. Some implications of the study to the tire industry are that high temperatures during vulcanization should be minimized; that heating at 230° F. or above causes permanent progressive degradation to both cotton and rayon

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cellulose; that small amounts of chain breakage may have effects on physical properties of tire cords out of proportion to their relative magnitudes; and some of the components of some of the treating baths -- namely, probably the alkali in the dip -- may be detrimental to the life of the cords.

- 11 deGRUY, Ines V., and Tripp, Verne W.

MICROSCOPICAL STUDIES ON THE SWELLING OF NATIVE, BLEACHED AND NITRATED CELLULOSE FIBERS. Bot. Rev. 17(8): 555-628. 1951. A translation from the French article by G. Mangenot and M. Raison published in Revue de Cytologie et Cytophysiologie Végétales, Vol. 6, Part 1, 1942.

The swelling patterns of cotton, flax, ramie, and the grasses, have been examined microscopically. Swelling was brought about in the unmodified or bleached cellulose with Schweitzer's reagent (cuprammonium hydroxide) or cupri-ethylenediamine hydroxide and in the nitrated fibers with neutral solvents such as acetone, cyclopentanone, methyl alcohol, and nitroglycerin. Strata which are resistant to swelling and dissolution are present in all the fibers examined, even in those which have been scoured and bleached. These strata include, besides the primary wall (cuticle) and middle lamella, an internal sheath immediately surrounding the lumen and structures in the thickness of the secondary wall, generally annular or spiralled. The structure of the fibers is used as a criterion of the theories proposed in the past to account for their swelling behavior and physical and chemical characteristics. Similarities and differences between the fibers studied are pointed out. The review is illustrated by 51 figures and cites 78 references.

- 12 FIORI, Louis A., and Brown, John J.

EFFECTS OF COTTON FIBER FINENESS ON THE PHYSICAL PROPERTIES OF SINGLE YARNS. Textile Res. Jour. 21(10): 750-757. 1951.

The effects of cotton fiber fineness on the physical properties of both coarse and fine single yarns of varying twist were investigated. The length factor was controlled by reducing the cottons to common quartile and mean lengths. The varieties studied -- Seaberry Sea Island, Mesa Acala, Tanguis, and Rowden 41-B -- ranged in fineness from 2.9 to 5.6 micrograms per inch and were approximately equal in other important fiber properties. A relation was found between fiber fineness and the turns per inch required in a single yarn to obtain the benefits of optimum yarn strength. Low-twist yarns decreased less rapidly from maximum strength when made from fine than when made from coarse fibers. In contrast, high-twist yarns decreased more rapidly in strength when made from fine than when made from coarse fibers. Yarns made from coarse fibers required more twist than those from fine fibers to attain maximum yarn strength. Fiber fineness did not materially affect yarn elongation. Fiber fineness was a critical factor of roving twist.



No.

13 FISHER, C. H.

COTTON STUDIES AT THE SOUTHERN REGIONAL RESEARCH LABORATORY. An address before the International Textile Congress, University of Ghent, Ghent, Belgium. September 1951. Congrès International des Sciences appliquées à l'Industrie Textile. [Proc.] Communication numero T14.

Examples of research at the Southern Regional Research Laboratory on the physical and chemical structure of cotton fiber; on chemical treatments to enhance the usefulness of cotton; and on mechanical processing to develop new, improved machinery and techniques for the manufacture of cotton products are given. In the fundamental field, information regarding the shape of the basic structural unit of cellulose has been obtained; an improved technique has been developed which uses cupri-ethylene diamine hydroxide solutions instead of cuprammonium as a solvent for cellulose in viscosity measurements; and the water-swelling capacity of cottons in comparison with other cellulosic fibers has been studied by use of the microscope. In chemical processing research, cotton flour and feed bags have been protected from insect penetration by treatment with pyrethrins mixed with a synergist; a simple washtub treatment making use of carboxymethyl cellulose results in cleaner and more soil-resistant cotton; and effective finishes using mineral pigments have been found for cotton shade cloth for tobacco fields. Also, by processes of aminization, phosphorylation, carboxymethylation, and partial acetylation, chemical groups can be introduced into the cellulose molecule to replace or combine with some of the hydroxyl groups. In mechanical processing research, fiber fineness has been investigated, a new draft guide has been furnished, and a new cotton opener and a new slasher have been developed. A dye test to determine cotton maturity is described which has met a specific difficulty encountered in cotton mills.

14 GOLDTHWAIT, Charles F., Buras, Edmund M., Jr., and Cooper, Albert S.

CHEMICAL SUBSTITUTION IN FIBROUS COTTON AND RESISTANCE OF SUBSTITUTED COTTON TO MICROBIOLOGICAL DETERIORATION. Textile Res. Jour. 21(11): 831-840. 1951.

The resistance for months to deterioration by microorganisms (in soil burial) of suitably acetylated fibrous cottons, some with only one-third of the hydroxyl groups substituted, depends upon the distribution as well as upon the total number of the acetyl groups present. At one-third substitution the amorphous cellulose is converted to triacetate; the cotton fiber still contains about two-thirds of the original cellulose, which is present as crystalline material surrounded by acetylated cellulose. The swelling capacity of the cotton in water is greatly reduced. Attacks by microorganisms apparently begin at the most readily accessible amorphous cellulose. Protection by partial acetylation is believed to be due to the blocking of hydroxyl groups, the filling of spaces between chains in the amorphous cellulose, and the suppression of swelling.

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Partial methylenation by treatment with formaldehyde may impart a moderate degree of rot-resistance, which seems best explained as being due to the suppression of swelling by cross-linking. Formaldehyde-containing resins which impart rot-resistance apparently act similarly.

The use of dyeing has been exemplified for qualitative tests to supplement other evidence regarding substitution and the composition and properties of substituted cottons.

- 15 GRANT, James N., Couturier, Geraldine M., and Rhodes, Mary W.

EFFECT OF A DYNAMIC FATIGUE TEST ON THE MECHANICAL PROPERTIES OF TIRE CORDS. Textile Res. Jour. 21(12): 867-875. 1951.

Changes in the mechanical properties of cords subjected to dynamic fatigue were measured for cotton, mercerized cotton, and rayon tire cords. These data were obtained by the use of an instrument which subjected the cords under tension to localized dynamic forces under controlled atmospheric conditions. The forces, when observed on an oscilloscope screen, were found to vary during the flex cycle. Flex life and ultimate elongation were found to be cumulative, regardless of whether the cords were fatigued continuously or were allowed to relax with or without static tension between periods of flexing. Calculated activation energies for fatigue failure were less than those for heat degradation. From the differences in properties a qualitative evaluation of tire cords behavior could be made.

- 16 ROWEN\*, J. W., Forziati\*, F. H., and Reeves, Richard E.

SPECTROPHOTOMETRIC EVIDENCE FOR THE ABSENCE OF FREE ALDEHYDE GROUPS IN PERIODATE-OXIDIZED CELLULOSE. Amer. Chem. Soc. Jour. 73(9): 4484-4487. 1951.

Infrared absorption spectra were obtained with mineral oil slurries of periodate-oxidized cotton cellulose and with the periodate-oxidation product from methyl 4, 6-benzylidene- $\alpha$ -D-glucopyranoside. These spectra show little change in the region of the spectrum in which the intense absorption of the C = O stretching vibration occurs, the 5.5- to 6.5-micron region. The results suggest either that the absorption of aldehydic carbonyl in this periodate-oxidized material is of unusually low intensity or that few if any aldehyde groups as such are present. A likely explanation of these data is that at least one and possibly both of the aldehyde groups of the oxidized anhydroglucose units have reacted with water, forming hydrates. The unhydrated aldehyde groups may have reacted with residual alcohol groups to form hemiacetal groups.

\*National Bureau of Standards.

No.

- 17 TRIPP, Verne W., Mares, Trinidad, and Conrad, Carl M.

THERMAL DEGRADATION IN TIRE CORDS. PART II. EFFECTS OF MODULUS, TOUGHNESS, AND DEGREE OF RESILIENCE. Textile Res. Jour. 21(11): 840-846. 1951.

Cotton and rayon tire cords from four stages of the manufacturing process were heated for 16 to over 1000 hours at temperatures ranging from 230-302° F., to test the effect on average modulus, breaking toughness, and degree of resilience at 50% of their breaking loads. The modulus and breaking toughness of all of the cords was decreased. The effects of the heat treatments were progressive with time of heating, and accelerated by raising the temperature. The degree of resilience of the cords was not significantly affected, even after severe losses of strength and toughness. The cords which had been vulcanized in rubber were less affected than those which had been unprocessed, dipped, or calendered. Cords that had been run to failure in a wheel test showed increased modulus and decreased toughness.

- 18 TRIPP, Verne W., Moore, Anna T., and Rollins, Mary L.

SOME OBSERVATIONS ON THE CONSTITUTION OF THE PRIMARY WALL OF THE COTTON FIBER. Textile Res. Jour. 21(12): 886-894. 1951.

The primary wall of fully matured cotton fibers has been isolated and its morphology and composition studied by the electron microscope and by chemical analyses. The primary wall appears to contain about 50% cellulose; protein, wax, and pectic substances occur in lesser amounts; cutin or suberin and mineral matter are also present. The concentration of noncellulosic substances in the primary wall is much greater than in the whole fiber. The primary wall under the electron microscope appears to consist of a network of cellulose fibrils, having diameters of 100-400 Å., surrounded by the noncellulosic constituents. Layers in the cellulose network have been observed.

Cottonseed, Peanuts, Rice, and Other Oilseeds

- 19 ANONYMOUS.

LIST OF PUBLICATIONS AND PATENTS 1944-1950 ON COTTONSEED AND PEANUT PROTEINS AND RELATED SUBJECTS. AIC-314. (Processed.) 1951.

Greater knowledge of the chemistry of cottonseed and peanut proteins would provide a reliable basis for developing new uses or expanding their present uses. This list of publications and patents for 1944-50 represents the initial accomplishment of the Southern Regional Research Laboratory in a program of research on the chemistry of these products. The references, 71 in all, are listed alphabetically by authors, within year divisions. An index is appended.



No.

20 ALTSCHUL, Aaron M.

RESEARCH ON COTTONSEED STORAGE AND PROCESSING AT THE SOUTHERN REGIONAL RESEARCH LABORATORY. Cotton Gin and Oil Mill Press 52(16): 24, 26, 28, 29, 30, 32. Cotton Digest 23(46): 6-7, 42-43, 46. 1951.

One objective of research on the storage of cottonseed has been the development of a principle of inhibition of biological changes in the stored seed by use of chemicals. Chemicals promising in laboratory tests were tested in commercial storage. The production of heat and the rate of formation of free fatty acids were found to be dependent on the initial moisture and free fatty acids content. In cooperative work with the Educational Service of the National Cottonseed Products Association, the Southern Laboratory is to provide nutrition investigators with cottonseed meals of known processing history. The investigators have found that experimentally made screw-pressed meals can be fed to hogs in a concentration up to 43% of the total diet and to chicks in a concentration up to 70%. Lower temperatures of cooking in the screw press operation resulted in meals with higher nutritive value and in some which did not cause yolk discoloration in stored eggs even when fed at levels of 20 to 25% of the diet.

21 BATSON, D. M., Thurber, F. H., and Altschul, A. M.

THE EFFECT OF SCREW-PRESS AND HYDRAULIC-PRESS PROCESSING CONDITIONS ON PIGMENT GLANDS IN COTTONSEED. Amer. Oil Chem. Soc. Jour. 28(11): 468-472. 1951.

A procedure is given for estimating the amount of intact pigment glands in cottonseed kernels and meal. Contents of intact pigment glands, of free gossypol, and of total gossypol in uncooked and cooked meats, and press cake samples from laboratory-scale tests, from hydraulic-press mills and a screw-press mill were determined. An important finding was that in the screw-press mill, where cooking was carried out without the addition of moisture, little change in percentage of recoverable glands or of free gossypol occurred during cooking, but both components were reduced to very low levels during passage of the cooked meats through the screw press.

In laboratory tests, when meats which had been cooked at low moisture content, were subjected to hydraulic pressures of 2000 and 20,000 p.s.i. the percentage of recoverable glands was reduced, but no corresponding decrease in free gossypol was found. Wet cooking of meats decreased the percentages of free gossypol and intact glands and, although hydraulic pressing failed to further reduce the free gossypol, the percentage of recoverable glands was sharply reduced by pressing at both levels. It is suggested that the high degree of effectiveness of the screw press in rupturing and disintegrating pigment glands is due to the development of shearing forces in combination with the compressive-type pressure. It is believed that a shearing action is more effective for this purpose than compressive force of similar magnitude.

No.

- 22 BOUCHER, Richard E., and Skau, Evald L.

PHASE RELATIONS PERTAINING TO THE SOLVENT WINTERIZATION OF COTTONSEED OIL IN HEXANE AND IN ACETONE-HEXANE MIXTURES. Amer. Oil Chem. Soc. Jour. 28(11): 483-487. 1951.

Systematic phase relation data pertaining to the solvent winterization behavior of a refined cottonseed oil have been obtained for commercial hexane and a mixed solvent consisting of 85% by weight of acetone and 15% of hexane. The effect of oil-solvent ratio, chilling temperature, holding-time, and agitation on the percentage of solid removed, the degree of winterization, and the settling qualities of the solid separating is shown in graphs.

These data, with those previously reported for acetone (J. Am. Oil Chem. Soc., 27, 556-564 (1950)) afford a basis for the selection of the optimum conditions and procedures in the application of solvent winterization to cottonseed oil.

- 23 BOUCHER, Richard E., and Skau, Evald L.

PHASE RELATIONS PERTAINING TO THE SOLVENT WINTERIZATION OF PEANUT OIL IN ACETONE-HEXANE MIXTURES. Amer. Oil Chem. Soc. Jour. 28(12): 501-504. 1951.

Systematic phase relation data have been obtained pertaining to the solvent-winterization behavior of a refined peanut oil in a mixed solvent consisting of 85% by weight of acetone and 15% of hexane. Graphs are given which show the effect of oil-solvent ratio, chilling temperature, holding-time, and agitation on the percentage of solid removed, the degree of winterization, and the settling qualities of the solid separating. The data afford a preliminary basis for pilot-plant design, selection of optimum conditions, and recognition of limitations for pilot-plant research on the solvent winterization of peanut oil.

- 24 FEUGE, R. O., Pepper, M. B., Jr., O'Connor, R. T., and Field, Elsie T.

MODIFICATION OF VEGETABLE OILS. XI. THE FORMATION OF TRANS ISOMERS DURING THE HYDROGENATION OF METHYL OLEATE AND TRIOLEIN. Amer. Oil Chem. Soc. Jour. 28(10): 420-426. 1951.

During the hydrogenation of methyl oleate, as much as 38% of trans isomers formed while the first 10% of methyl stearate was formed. The rate of formation of trans isomers was increased by increasing the temperature, increasing the catalyst concentration, and decreasing the degree of dispersion of the hydrogen. The hydrogenation of methyl oleate always resulted in the establishment of an equilibrium between cis and trans isomers, and the concentration of trans isomers was always 67%, calculated on the basis of total unsaturated constituents. It is concluded that all of the iso-oleic acids adsorbed hydrogen at the same rate as oleic acid and were adsorbed and desorbed from the nickel catalyst with equal ease.



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During the hydrogenation of triolein trans isomers are formed at a slightly lower rate than in the hydrogenation of methyl oleate. Partial hydrogenation of triolein also resulted in the establishment of an equilibrium between cis and trans isomers of oleic acid, but at values of less than 67% of trans constituents (based on the total unsaturated constituents) observed with methyl oleate.

- 25 PEUGE, R. O., and Janssen, H. J.

BLEACHING OF COTTONSEED OIL IN HEXANE. Amer. Oil Chem. Soc. Jour. 28(10): 429-432. 1951.

Cottonseed oil dissolved in commercial hexane was bleached readily by activated clay and carbon, and the reduction in color was greater than that obtained in the absence of a solvent, other conditions being similar. Countercurrent bleaching of cottonseed oil-hexane solutions in columns packed with adsorbents proved to be highly efficient with respect to the utilization of the adsorptive capacity of a given quantity of clay and also with respect to the amount of oil lost by adsorption. Columns of spent bleaching clay could be regenerated easily with acetone. The Lovibond red color of the first batch of oil bleached in one such column was 2.8, while that of the twentieth batch, obtained after the column had been used and regenerated 19 times, was 3.8.

- 26 FISHER, C. H.

SOME REMARKS ON OILSEEDS RESEARCH AT THE SOUTHERN REGIONAL RESEARCH LABORATORY. Natl. Oil Mill Supt. Assoc. Proc., Fifty-Seventh Ann. Conv., May 30-June 1, 1951. Oil Mill Gazetteer 56(1): 32-34. 1951.

Research on cottonseed and other oilseeds at the Southern Regional Research Laboratory and related research on oilseeds conducted in the other regional research laboratories are discussed. Examples given of cottonseed research include cooperative work on the meal and chemical studies of gossypol.

- 27 FISHER, Gordon S., and Bickford, W. G.

PREPARATION OF A RELATIVELY ANTIOXIDANT-FREE VEGETABLE OIL. Amer. Jour. Pharm. 123(7): 233-236. 1951.

A method for preparing essentially antioxidant-free and nearly colorless vegetable oils is described. The oil is dissolved in pentane and the solution is passed through a specially prepared adsorption column containing layers of activated carbon and filter aid, activated alumina, and anhydrous sodium sulfate. Peanut oil treated by this method yielded a product having a keeping time of about 2 hours by the active oxygen method at 97.7° C. Such substrate oils are useful in testing and distinguishing between antioxidants and synergists, and in the preparation of vitamin-free fat diets.

No.

- 28 GASTROCK, Edward A.

RECENT TECHNOLOGICAL ADVANCES IN COTTONSEED PROCESSING. Oil Mill Gazetteer 56(1): 35-37. 1951.

Recent technological advances in cottonseed processing, using hydraulic pressing, screw pressing, and solvent extraction, are briefly reviewed. Problems that still require solution include the need to increase oil yields with hydraulic pressing, to improve the quality of the oil by screw pressing, and to overcome the difficulties in preparing material for solvent extraction. A simplified solvent extraction process, using filtration as the major unit operation, and research in which much has been accomplished to improve product quality are described in detail.

- 29 HEINZELMAN, Dorothy C., and O'Connor, Robert T.

TRACE METALS IN COTTONSEED KERNELS. Amer. Oil Chem. Soc. Jour. 28(9): 373-374. 1951.

Spectrochemical analysis of cottonseed kernels of 8 varieties of cotton grown at one location and 1 variety grown at 13 locations showed no typical differences in contents of copper, iron, and manganese associated with variety and location of growth. All samples contained traces of boron and zinc. They were not found to contain traces of aluminum, chromium, nickel, and tin.

- 30 HOGAN, Joseph T., and Arthur, Jett C., Jr.

VISCOSITY OF COTTONSEED MEAL DISPERSIONS. Amer. Oil Chem. Soc. Jour. 28(10): 436-438. 1951.

It has been shown that the apparent viscosities of cottonseed meal dispersions depend on the concentration of meal and that of sodium hydroxide, and on the addition of trichloroacetate ion. Also, it has been shown that the viscosities of the glue dispersions are independent of the nitrogen solubilities of the protein contained in the meal and, for the processes evaluated, independent of the method of removal of the oil to produce the meal.

- 31 PLANCK, Ralph W., and Pack, Frank C.

CURRENT RESEARCH ON TUNG OIL AT THE SOUTHERN REGIONAL RESEARCH LABORATORY. Amer. Tung Oil Assoc. Proc., Eighteenth Ann. Conv., Biloxi, Miss., October 11-12, 1951, 27-31, 1951.

To permit analysis of partially hydrogenated tung oils, existing methods have been modified for the measurement of total unsaturation by quantitative hydrogenation and for the spectrophotometric determination of polyunsaturated acids. Abstracts of more than 2800 tung articles and patents have been compiled.

No.

- 32 POMINSKI, Catherine H., Castillon, Leah E., Von der Haar, Patricia, Brown, Lawrence E., and Damare, Hilton.

STORAGE OF GOSSYPOL. Amer. Oil Chem. Soc. Jour. 28(8): 352-353. 1951.

Pure gossypol was stored for 18 months at temperatures of 3° and 23-28° C. in the presence or absence of light and air. On the basis of combustion data, absorption spectra, antimony trichloride tests, and melting points of the original and stored samples it can be concluded that gossypol can be stored without deterioration for at least 18 months at temperatures from 3° to 23-28° C. in the absence of light, irrespective of the presence or absence of air.

- 33 POMINSKI, Catherine H., and Von der Haar, Patricia.

REACTIONS OF SOME GOSSYPOL-LIKE PIGMENTS WITH ANILINE AND p-ANISIDINE. Amer. Oil Chem. Soc. Jour. 28(10): 444-446. 1951.

Gossypurpurin and diaminogossypol have been shown to react with aniline to give the same reaction product as does gossypol. These pigments also react with p-anisidine to give products whose absorption spectra exhibit maxima in the same positions as that of the reaction product of gossypol and p-anisidine.

- 34 POMINSKI, Catherine, H., Miller, Charlotte B., Von der Haar, Patricia, O'Connor, Robert T., Castillon, Leah E., and Brown, Lawrence E.

PIGMENTS OF COTTONSEED. IV. GOSSYPURPURIN. A PURPLE PIGMENT RELATED TO GOSSYPOL. Amer. Oil Chem. Soc. Jour. 28(11): 472-475. 1951.

The properties of gossypurpurin prepared from gossypol via diaminogossypol were compared with those of gossypurpurin isolated from pigment glands. A tentative molecular formula for synthetic gossypurpurin,  $C_{30}H_{32}O_7N$ , has been proposed on the basis of its elementary composition. The native pigment could not be obtained in the same degree of purity as the synthetic product and the analytical data could therefore not be brought into exact agreement for the two products. However, solutions of both pigments in chloroform exhibited almost identical absorption spectra and had identical antimony trichloride tests. Qualitative reactions seem to indicate that the functional groups of both the native and the synthetic gossypurpurin are identical, and the ready conversion of both products to gossypol upon contact with acid seems to indicate that their basic structures are similar.

- 35 POMINSKI, Joseph, Laborde, Elster J., Cirino, V. O., and Vix, H. L. E.

PROCESSING VARIABLES IN PEANUT PROTEIN PREPARATION. Amer. Oil Chem. Jour. 28(12): 508-512. 1951.

A general equation was derived with which the percentage yield of protein may be calculated for a solvent-extracted peanut meal at various



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water-meal ratios. Results of investigations showed that nitrogen solubility for ground and unground meal increased slowly with temperature but was little affected by the water-meal ratio and that peptization might be considered complete in 30 minutes. For unground meal the yield of protein increased with increase in water-meal ratio. Repeated peptizations increased the yield, indicating the desirability of a countercurrent system of peptization. Grinding of meal resulted in increased peptization and increased protein yields.

- 36 POMINSKI, Joseph, McCourtney, Emile J., Stansbury, M. F., D'Aquin, Esler L., and Vix, Henry L. E.

LYE-DIPPING FOR THE REMOVAL OF OBJECTIONABLE SKIN COLOR FROM VARIOUS GRADES OF SHELLED SPANISH PEANUTS. Amer. Oil Chem. Soc. Jour. 28(12): 513-516. 1951.

Experimental data have been obtained on the lipids and protein losses in the lye treatment of the various grades of shelled Spanish peanuts. It has been shown (a) that lipid and protein losses on U. S. No. 1 shelled peanuts are lower for the cold than for the hot treatment though both are of a low level; (b) that these losses in the cold treatment increased with the use of lower grade shelled peanuts, U. S. No. 2 and oil mill stock; (c) that protein solubility of peanut kernels was negligibly affected by lye solution treatment, drying at 125° F., cold solvent extraction with hexane, air-drying, and oven-drying at 125° F.; and (d) that damaged peanut kernels imparted color to protein.

- 37 SINGLETON, W. S., and Vicknair, E. J.

DILATOMETRIC INVESTIGATIONS OF FATS. V. VOLUME CHANGES ASSOCIATED WITH THE POLYMORPHISM AND MELTING OF MONOSTEARIN. Amer. Oil Chem. Soc. Jour. 28(8): 342-343. 1951.

1-Monostearin, 99.2% pure, was prepared and the polymorphic forms, known as sub-alpha ( $\alpha_s$ ), alpha ( $\alpha$ ), beta prime ( $\beta'$ ), and beta ( $\beta$ ), were obtained, and their expansibilities were determined over the temperature range from the solid to the liquid state. The melting dilation of each form was calculated from the observed expansibilities. From the values for the expansibility, density, and melting dilation, the specific volume of any of the polymorphic forms of monostearin at any temperature from the solid to the liquid state may be calculated. The melting dilations of stearic acid, monostearin, and tristearin are in direct proportion to the mole percentage of stearyl groups present in each compound. By means of this relationship a melting dilation for distearin was calculated.

- 38 SOLTOFT, P., and Dollear, Frank G.

EVALUATION OF SAFFLOWERSEED OIL IN EDIBLE FAT PRODUCTS. Amer. Oil Chem. Soc. Jour. 28(8): 335-338. 1951.

Four varieties of safflowerseed grown in Nebraska and Colorado were

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examined with respect to the composition of the seed, hulls, extracted meal, and oil. The oil from Nebraska 852 variety was refined, bleached, and deodorized; and refined, bleached, hydrogenated, and deodorized. The liquid oil and the hardened fat were analyzed with respect to their fatty acid compositions and their stabilities to rancidity and flavor reversion were determined. The results indicated that safflowerseed oil is not so suitable for edible purposes as other domestically produced edible oils.

- 39 SPADARO, James J., Graci, Angelo V., Gardner, Homer K., Parker, Jack S., Laborde, Elster J., and Gastrock, E. A.

PRE-PILOT PLANT INVESTIGATION OF A SOLVENT EXTRACTION METHOD FOR COTTONSEED BASED ON REDUCED PRESSURE FILTRATION. Oil Mill Gazetteer. 56(1): 77-81. 1951.

A pre-pilot plant investigation of a new method of solvent extraction which presents numerous potential advantages is reported. Several methods of preparation of cooked and uncooked flakes are described. Filtration rates, miscella concentrations, extractabilities, and capacities per square foot of filtering area are given, and effects of cake thicknesses and slurring time are illustrated by graphs. A miscella with a high concentration of oil and an extracted cake with low residual oil and low solvent content were obtained. A flow diagram of the process is included.

- 40 WELLBORN, W. A., Parker, Jack S., Molaison, Laurie J., and D'Aquin, E. L.

PILOT PLANT STEAM REFINING OF HIGH FATTY ACID RICE BRAN OIL. The Rice Jour. 54(8): 6-8. 1951.

High free fatty acid crude rice bran oil was steam-stripped in pilot-plant equipment under various conditions of temperature, vacuum, and quantity of blowing steam. Observations were made on the recovery of the crude distilled acids, reduction in the overall refining loss, and the effect on the oil quality. The work indicated that bleaching, degumming, and dewaxing rice bran oil of high fatty acid content, followed by steam refining, and by alkali refining only where required, should warrant consideration as a practical method for reducing refining loss and for producing high-grade fatty acids and an improved oil.

#### Sweetpotatoes

- 41 BATSON, D. M., and Hogan, J. T.

BAUME STARCH CONCENTRATION RELATIONSHIPS FOR AQUEOUS SUSPENSIONS OF SWEETPOTATO STARCH AT DIFFERENT TEMPERATURES. AIC-296. (Processed.) 1951.

A method for computing Baume starch concentration data for aqueous suspensions of sweetpotato starch is described. The computations are



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based on a determined value for sweetpotato starch density and on the known relationship between water density and temperature. A master table showing computed relationships between Baumé, starch concentration, and suspension temperature for each degree Baumé between 0° and 25° and for suspension temperatures at 5° intervals between 15° and 50° C. is presented. The table is suitable for both starch-factory and laboratory use for interpreting Baumé hydrometer readings in terms of starch concentration. The validity of the computed data was verified experimentally.

- 42 DOREMUS, Gordon L., Crenshaw, Frank A., and Thurber, F. H.

AMYLOSE CONTENT OF SWEETPOTATO STARCH. Cereal Chem. 28(4): 308-317. 1951.

The amylose content of starches prepared from 22 varieties of sweetpotatoes as determined by potentiometric iodine titration, varied from 17.5% to 21.7%, with the majority of the values ranging from 20.0% to 21.7%. In no instance was there a sufficient trend toward high amylose to content to make the variety of interest in selection or breeding for high amylose starch. The percentage of iodine bound by sweetpotato amylose of the highest purity preparation was 19.3. Breaks in the horizontal sections of the iodine sorption curves suggest the presence in sweetpotato starch of small amounts of a fraction intermediate between amylose and amylopectin in degree of branching or the presence in the amylopectin fraction of external branches sufficiently long to bind appreciable quantities of iodine at higher free iodine concentrations. A closed titration chamber for use in making potentiometric iodine titrations and a procedure for the laboratory preparation of starch are described.

#### Miscellaneous

- 43 REEVES, Richard E.

CUPRAMMONIUM-GLYCOSIDE COMPLEXES. Advances in Carbohydrate Chem., Academic Press Inc., New York, N. Y. Vol. VI. pp. 107-134. 1951.

The cuprammonium-glycol reaction is discussed together with the spatial requirements for complexing, and correlations between reaction with cuprammonium and other reactions of carbohydrates. The cuprammonium complexes cellulose, lichenin, starch, glycogen, the Schardinger dextrans, laminarin, the polysaccharide from Phytomonas tumefaciens, the Dextran from Leuconostoc dextranicum, and mannans and xylans are considered. Cuprammonium complexes are considered also from the point of view of the shape of pyranoside rings. Appendices give methods of preparation of cupra A and cupra B, and methods of determining optical rotations and of making conductometric measurements in cuprammonium solutions.

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- 44 LEAVER, J. W., Schuyten, H. A., Frick, J. G., Jr., and Reid, J. David.

STEARAMIDOMETHYL ETHERS. Jour. Organic Chem. 16(7): 1111-1116.  
1951.

The stearamidomethyl ethers of methanol, ethanol, propanol-2, n-butanol, octanol, and phenol have been prepared and characterized. The ethyl, isopropyl, butyl, and phenyl derivatives are new compounds. It has been shown that their properties do not resemble those of ethers, but rather resemble those of acetals as would be predicted.

Sugarcane Products Investigations  
New Orleans, La., and Box 171, Houma, La.

- 45 GUILBEAU, W. F., Black, C. L., and Martin, L. F.

A STUDY OF THE PROCESSING OF SUGARCANE ON A PILOT PLANT SCALE. The  
Sugar Jour. 14(6): 18-26, 28, 30. 1951.

The milling properties of samples of 8 varieties of sugarcane grown in the Baton Rouge area were determined at the Louisiana State University, and the samples were then ground in the University's Audubon Sugar Factory. The resulting juice was delivered to a pilot plant designed for complete continuous processing on small scale for studies of processing qualities of the juices, including the rate of clarification, the volume of mud produced, the clarity of the juice, and the increases in apparent purity effected by clarification under uniform conditions. The work established that small samples of cane can be used and continuous processing carried out on 250-300 gallons of juice to provide reproducible data on the behavior of the juice in clarification which is applicable to factory operations. This makes possible the relatively early evaluation in this respect of new varieties of which only limited quantities are available.

- 46 MARTIN, L. F., Robinson, Helen M., and Fahs, F. J.

PROGRESS IN CANDY RESEARCH. Report No. 24. Report on Utilization of  
Agricultural Products in Confectionery in Cooperation with the  
National Confectioners' Association from June 1, 1951 to October 31,  
1951. (Processed.) Nat'l. Confectioners' Assoc. 1951.

Work has been continued in close cooperation with the Food Laboratories of the General Products Division of the Quartermaster along those lines which they have indicated are of most importance for the improvement of candies for military rations. Samples of spun peanut butter bars containing antioxidants and yeasts were stored at the Southern Regional Research Laboratory and analyzed to determine whether rancidity was the cause of the loss of flavor during storage and to determine the effectiveness of the added ingredients in preventing it. Fruit nougat, desired to replace a chocolate item in military rations, was made, and work on this piece still in progress; honey, sorbitol, and emulsifiers are being used. Experiments have been made with starch emulsifiers in

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an attempt to improve the initial texture and retention of tenderness in starch gums. In experiments with new ingredients submitted for trial, a caramel, a nougat, and a fig bar have been made using vacuum-dried fruit powders; work has been started to determine the effectiveness of sorbitol in lengthening the shelf life of marshmallows. High-grade shortenings produced from animal fats, and stabilized by various antioxidants, have been used in making chocolate and vanilla fudge and a caramel which tasters agreed showed significant difference in acceptability according to the type of shortening. In continued work to find a stable oil to replace mineral oil for slab dressings a high-grade of sesame oil was tried alone, and with the addition of sesamol; and aceto-stearin, a synthetic glyceride developed at the Southern Regional Research Laboratory, which is saturated and should be stable towards oxidation, was tried. Storage tests indicated that further tests on the aceto-stearin should be conducted. In continued studies of antioxidants, yeasts, both primary and recovered, were evaluated. The natural yeast antioxidants were quite effective in preventing oxidation of the fat in butter creams; free fatty acid formation was not prevented, as in the case of other antioxidants. Preliminary data are given on the effectiveness of glycerol in retarding the development of free fatty acid in butter creams.

Tung Oil Investigations  
Bogalusa, La.

- 47 HOLMES, Raiford L., Minor, Jacob C., and McKinney, R. S.

THE DETERMINATION OF MOISTURE IN TUNG FRUIT. Amer. Tung Oil Assoc. Proc., Eighteenth Ann. Conv., Biloxi, Miss., October 11-12, 1951, 18-26. 1951.

Six methods for determining moisture in tung fruit and seeds were investigated and the results with their use were compared. The highest values were obtained by drying the ground tung fruit in the vacuum oven at 101° C. for 2.5 hours under 12 mm. pressure, and by the Karl Fischer titration method. Somewhat lower moisture values were obtained by the forced draft oven and toluene-distillation methods. For routine analysis, heating in a hot-air blower for 15 minutes at 260° F. (126.7° C.) and adding a correction of 1.35% gives sufficiently accurate values for factory control purposes. The meter for measuring radio frequency impedance did not have a wide enough range to include many samples encountered.

Food Fermentation Investigations  
P. O. Box 5578, Raleigh, N. C.

- 48 BELL, Thomas A.

PECTOLYTIC ENZYME ACTIVITY IN VARIOUS PARTS OF THE CUCUMBER PLANT AND FRUIT. Bot. Gaz. 113(2): 216-221. 1951.

The cucumber plant and fruit (Cucumis sativus) have been found to be a source of a pectolytic enzyme as measured by a loss in viscosity of a



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pectin solution. The enzyme of the cucumber was strongly active in the seeds, staminate and pollinated pistillate flowers, and ripe fruit, but was not found in the unpollinated flowers, leaves, petioles, and stems. Enzyme activity was weak to negative in the eight stages of cucumber development of immature fruit. Pectolytic enzyme activity was absent in the green tomato (Lycopersicon esculentum) including the embryo with flowers and six stages of green-fruit development. High activity of the enzyme was found in the red ripe tomato fruit.

Fruit and Vegetable Products Investigations  
P. O. Box 83, Winter Haven, Fla.

- 49 BISSETT, Owen W., and Veldhuis, M. K.

HYGROSCOPIC CHARACTERISTICS OF DRIED CITRUS PULPS CONTAINING CITRUS  
MOLASSES. Feedstuffs. 23(36): 26, 28, 30, 31. 1951.

Dried citrus pulps with varying citrus molasses content were prepared and subjected to relative humidities from 40 to 80%. The relative humidity was the predominating factor, although somewhat higher moisture contents were found with higher molasses content. No samples showed mold growth at 70% relative humidity and all samples molded at 80% humidity. The results indicate not much more difficulty in handling dried citrus pulp with added molasses than dried citrus pulp alone.

- 50 DuBOIS\*, C. W., and Kew, T. J.

STORAGE TEMPERATURE EFFECTS ON FROZEN CITRUS CONCENTRATES. Refrig.  
Engin. 59(8): 772-775, 812. 1951.

Commercial frozen citrus concentrates of orange juice, grapefruit juice, tangerine juice, and grapefruit-orange juices, stored at various temperatures, were studied periodically. The storage studies revealed information on the kind and extent of changes to be expected at temperatures above 0°F. No consistent changes in viscosity were shown. Bacteriological count dropped rapidly in all instances and was probably of little importance so far as flavor was concerned. Changes during storage were demonstrated in cloud retention as indicated by the cloud index test and other observations in can condition and flavor. The results of this work show that storage temperature is an important factor in maintaining the stability and acceptability of these concentrates; that the prevention of separation and retention of cloud in concentrate is affected by the holding temperature and period of storage at that temperature. The rate of corrosion of a can containing frozen concentrate is affected by the storage temperature. At temperatures of 0°F or below there was no corrosion for 330 days of storage. No correlation could be made between viscosity and changes in cloud retention, flavor, and other properties. It is not evident that microorganisms contribute to the changes which occurred in the products during frozen storage. It was learned that visible signs of deterioration preceded, by some time, the changes in flavor detected by the taste panel in orange concentrate.

\*Minute Maid Corp., Plymouth, Florida.

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Retention of full cloud in reconstituted concentrate indicates to the consumer the high quality of that concentrate. Storage temperatures greatly affect the rate of chemical and physical change in stored concentrates.

Naval Stores Investigations  
Naval Stores Station, Olustee, Fla.

51 COLLINS, David N., and Patton, E. L.

PAST, PRESENT AND FUTURE OF A REJUVENATED PROCESS INDUSTRY: A NEW TACK FOR GUM NAVAL STORES. Chem. Engin. 58(9): 154-156. 1951.

Fifty years ago the processing of turpentine and rosin was a backyard science. Distilling equipment was wood-fired and crude. After distilling off the turpentine, the turpentine either threw away the rosin, wood chips, pine needles, dirt, etc., in the bottom of the kettle or strained out most of the trash and sold it to a soapmaker in Philadelphia. Then the salesman for petroleum solvents began to call on the turpentine user. The paint maker who had thinned his paint with gum turpentine at 50 c. a gallon was more than happy to use a petroleum fraction backed by the oil company's research laboratory at less than 10 c. a gallon. Gum rosin fared a little better. Rosin is used both as a cheap organic acid and as cheap resin; no competitors appeared in the acid field, and better resins for paints were themselves mostly rosin derivatives.

Today, the processing situation has changed radically thanks to the Department of Agriculture. In 1931, the Department established its Naval Stores Station at Olustee, Fla. In 1941, the government's Olustee process was introduced. Its use revolutionized pine gum processing. The future problem of the naval stores industry is the problem of selling. The most available field for the processor is the development of rosin derivatives, such as ester gums and gloss oil. Research using pine gum directly is being conducted. For example, maleo-pimaric acid has been produced, and is suitable for uses in varnishes and emulsifiers.

52 McCONNELL, N. C., and Patton, E. L.

BETTER ROSIN BY DOUBLE-WASHING IN GUM CLEANING. AIC-311. (Processed.) 1951.

A thoroughly clean rosin, one that is entirely free of mineral and oxalic acids, can be made from pine gum by double-washing the filtered gum. Conventional cleaning processes regularly include a single water-washing of filtered and settled gum. Gum cleaned with a single washing produces a high-grade, brilliant rosin, but such rosin may still contain traces of contaminating materials. A second wash -- double-washing -- can be effected in the same cycle by forcing the gum, which by gravity separation has risen to the top of the tank leaving the wash water in the bottom, by means of the pump again into the wash water at the bottom of the tank, remixing water and gum. This operation requires about one hour per tank of gum in most plants.



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53 PATTON, E. L.

NEW HORIZONS SEEN FOR PINE GUM THROUGH RESEARCH. Naval Stores Rev.,  
Internatl. Yearbook 1951. 80-82, 96-97. 1951.

Until about 1931, when the Department's Naval Stores Station was established, practically all turpentine and resin were produced on more than a thousand fire stills in the woods; there was no centralization of the industry; and methods were faulty and wasteful. Today, fewer than 50 fire stills operate. In their place 29 large central processing plants buy the gum produced by more than 35,000 farm people as a cash crop. Now with the development of the lower-cost petroleum products to compete with turpentine, steps are being taken by the Naval Stores Research Division to develop new chemical compounds from pine gum. As a mixture of hydrocarbons and organic resin acids, pine gum makes a good starting material for the production of new products. Also, the Naval Stores Research Division attempts to improve the competitive position of the gum naval stores industry through improvements in product quality control during processing.

54 PATTON, E. L.

PROGRESS IN GUM NAVAL STORES PROCESSING. Jour. South. Res. 3(6):  
20-21. 1951.

Until about 1935 individual operators or small groups of operators, used crude fire stills to distill the gum of their own or leased trees. The direct-fire methods yielded products satisfactory for a variety of markets. But the rosin still contained bark or trash and was often discolored by rust. The acid entrained in the turpentine during distillation was corrosive to the tanks in which it was transported. It is estimated that these inadequacies caused the industry annually a loss of 10 percent. Chemists and engineers of the Department of Agriculture developed the new methods and devised the new equipment which were needed to change this situation. The first improvement was the better construction and better operation of fire stills. "Government still settings" reduced scorching and fire hazards. But the fire still did not yield products of the quality desired for many uses. After experimentation, the Olustee Station developed a steam still, using a batch process, which provided precise temperature control. About 90 percent of all gum rosin and turpentine are produced by this method. The old-type direct fire stills, once numbering about 2500, today are less than a hundred. The latest improvement in steam distillation of pine gum is a commercial-size continuous steam still built and tested at the Naval Stores Station. Simultaneously with the development of improved distillation processes, a new method of cleaning the crude gum was developed whose use has become common throughout the industry.

PRESS NOTICES, RESEARCH ACHIEVEMENT SHEETS

Improved Methods Sought for Flameproofing Cotton Fabrics. July 23.  
USDA 1793-51.

New Moisture Determination Gives More Accurate Check on Peanut Value.  
Res. Achvt. Sheet 144(C). (Processed.) July 1951.

New Methods Developed for Determining Gossypol in Cottonseed, Res.  
Achvt. Sheet 145(C). (Processed.) July 1951.

Dr. Walter M. Scott Honored by Textile Institute of Great Britain.  
August 10. USDA 1974-51.

PATENTS

ALTSCHUL, Aaron M., and Castillon, Leah E.

WATER-DISPERSIBLE COMBINATION PRODUCTS OF GOSSYPOL AND CARBOHYDRATES.  
U. S. Patent No. 2,563,808; Aug. 14, 1951.

Mixing gossypol and carbohydrates (potato starch, dextrose) in basic aqueous solution, neutralizing, and drying without heat, produces water-dispersible combination products having physiological properties different from gossypol.

ALTSCHUL, Aaron M., Condon, Marjorie Z., and Lambou, Madeline G.

METHOD OF PREVENTION OF DETERIORATION IN SEEDS. U. S. Patent No.  
2,571,095; Oct. 16, 1951.

The biologically induced deterioration of cottonseed containing above 15% moisture is inhibited by contacting the seed with from 0.2 to 1.0% (by weight of dry seed) of a mixture of about 10 parts by weight propylene glycol dipropionate per part of 1,3-dimethyl-4,6-bis(chloromethyl)benzene, and after about 1 to 3 days reducing the moisture content of the seed below about 15% without the application of heat.

GOLDBLATT, Leo A., and Oldroyd, Dorothy M.

HALOGENATED TERPENE ADDITION COMPOUNDS. U. S. Patent No. 2,564,685;  
Aug. 21, 1951.

Polychloro derivatives of beta-pinene are produced by reacting beta-pinene with a carbon tetrachloride or ethylene hexachloride in the presence of an organic peroxide.

RUSCA, Ralph A.

APPARATUS FOR APPLYING SIZINGS AND OTHER COATINGS. U. S. Patent No.  
2,564,725; Aug. 21, 1951.

The apparatus features a simple means of regulating the amount of solution applied and a means for driving the rolls which eliminates stuffing boxes.

RUSCA, Ralph A., and Kyame, George J.

METHODS AND APPARATUS FOR DRYING SIZED OR OTHERWISE IMPREGNATED TEXTILE MATERIAL. U. S. Patent No. 2,578,744; Dec. 18, 1951.

The process of drying comprises passing spaced impregnated textile strands through a radiant heating zone where they are exposed to rays from a gas-fired, infra-red generator; controlling the ratio of combustible gas to oxidizing gas supplied to the generator and to the radiant heating zone to obtain a neutral, oxidizing, or reducing atmosphere; sucking the products of combustion into a lower temperature heating zone of reduced cross-section, in which the strands move in the direction of, and in contact with, the combustion products, the strands being farther apart in the lower temperature zone.

ST. CLAIR, William E., and Lawrence, Ray V.

ALUMINUM RESINATES AND METHOD OF PREPARATION. U. S. Patent No.  
2,567,250; Sept. 11, 1951.

A new type of aluminum resinates is produced by reacting a rosin material, and aldehyde or an aldehyde-yielding material and a reactive aluminum compound at from about 90° to 100° C. For example, such a resinate is produced by fusing gum rosin, paraformaldehyde and basic aluminum acetate at about 300° C. The new resinates are characterized by having melting, reacting, and decomposing temperature which are generally higher than the resinates heretofore known.

ST. CLAIR, William E., and Lawrence, Ray V.

METAL RESINATES AND METHOD OF PREPARATION. U. S. Patent No. 2,572,071;  
Oct. 23, 1951.

Naval refusible, hydrocarbon soluble metal resinates are produced by reacting a rosin material, for example, gum rosin; an aldehyde or an



aldehyde-yielding material, for example, formaldehyde; and a metal or a reactial metal compound, for example, zinc oxide. The reactants can be combined in substantially any order and in widely varying proportions. The reaction can be conducted at temperatures of from about 90° to 400° C. These resins are characterized by a relatively high hydrocarbon solubility, by a relatively high stability towards heat, and by the fact that they can contain a relatively high percentage of metal.

SCHUYTEN, Hartwig A., Weaver, Jeremiah W., and Reid, John David.

SILICON CONTAINING DERIVATIVES OF CELLULOSIC MATERIALS. U. S. Patent No. 2,562,955; Aug. 7, 1951.

Alkylsilyl ethers of cellulose are produced by reacting a cellulosic material with an alkylhalosilane in the presence of a tertiary amine.

VIX, Henry L. E., Spadaro, James J., Pollard, Elisha F., Gastrock, Edward A., Persell, Ralph M., and Murphey, Charles H., Jr.

PROCESSES FOR THE FRACTIONATION OF COTTONSEED. U. S. Patent No. 2,579,526; Dec. 25, 1951.

Cottonseed meal is disintegrated in hexane to reduce at least 70% of the meal tissue to a size of 2 to 40 microns, the disintegration releasing the intact pigment glands. The meal is then separated by settling in a body of hexane, the settling being continued until the hulls and whole glands settle below and the fine particles of meal tissue remaining suspended in the hexane. The suspension is then removed.

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CHEMICALS WE GET FROM TURPENTINE. Naval Stores Rev. 61(26): 16-17, 24-28. 1951. [Previous publication in Yearbook of Agric. "Crops in Peace and War" 1950-1951. pp. 815-821.]

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THE INDUSTRIAL UTILIZATION OF ROSIN. Naval Stores Rev. 61(30): 16-17, 25-28. 1951. [Previous publication in Yearbook of Agric. "Crops in Peace and War" 1950-1951. pp. 822-826.]

McKINNEY, Robert S.

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RESEARCH MODERNIZES THE GUM NAVAL STORES INDUSTRY. Forest Prod. Res. Jour. 1(1): 16-19. 1951. [Previous publication in Naval Stores Rev. 60(48): 13-14, 22-23. 1951.]

VELDHUIS, M. K.

CHEMISTRY AND TECHNOLOGY OF CITRUS. Citrus Indus. 32(8): 7-9. 1951. [Previous publication in Yearbook of Agric. "Crops in Peace and War" 1950-1951. pp. 263-267.]

